

THE SERVICE AUTOMATION AND ROBOTICS IN HOSPITALITY INDUSTRY: A STUDY ON BUSINESS IMPLICATIONS

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ABSTRACT

Hospitality Industry is one of the fastest growing sectors and it plays a major role among the growth indicators of a Country. As the hotel inventory and keys increases, and registers a remarkable growth, customer expectations transcend for more positive and personalized experience. Hospitality industry tries to overcome this challenge by implementing advanced technologies and automation for providing an impeccable service that exceeds customer expectations of late, the hospitality industry players have also been bitten by the technology bug and introduced Artificial Intelligence, Virtual Reality, Service Automation and Robotics in various functions and deploy solutions to attract and retain guests. The rapid growth of technology paves way for the introduction of automation and robotics in the hotel industry, especially for those services such as concierge and housekeeping that demands repetitive task with equal efficiency. The hospitality industry perceives an improved service quality and profitability through the implementation of robotics and automation that can meaningfully redefine the industry in the years to come.

The major players in hospitality industry tend to spend more on labour accounts than the other operational accounts and there arises a need to cut down labour cost. Implementation of robotics and service automation in various operations becomes the key to overcome this huge challenge of bringing an efficient labour control and at the same time to deliver a consistent quality service for the guests.

This study examines the adoption of service automation and robotics in various operational functions of the hotel and its business implications in terms of capacity to create a better customer experience and greater brand loyalty. The paper also discusses on the challenges of implementation and acceptance of robotics.

KEYWORDS: Robotics, Service Automation, Hospitality, Service Quality & Cost Analysis

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INTRODUCTION

The growth of Hospitality Industry has been remarkable as evident with hotels and brands increasing day by day in the global market. As the industry grows, customer expectation on the hospitality also transcends with a need for faster and accurate service. To meet the needs of the customer and to overcome the challenges, hospitality sector moves towards implementation of advanced technologies and automation for providing an impeccable service that exceeds customer expectations.

Automated technology and robotics are revolutionising the hospitality industry for improved customer experience and efficiency. Automation has been a hot topic in the hospitality industry over the past few months.

From self-service kiosk, concierge robots, virtual reality, electronic butlers to fully robotic hotels, the hotels have been embracing technology and self-automation to improve their operations and enhance the guest experience.

In the recent era, technology has been incorporated from room reservation to room services and billing, and has been helpful in ensuring seamless customer service. Service automation plays an integral role in converting independent and disconnected processes into simplified, integrated and automated workflows.

Another feature of automation technology that is being adopted and used increasingly by the hotel industry is the Robotics. From Japan's Henn – na hotel which is a fully staffed robot hotel to Hilton's concierge robots that serve hotel guests with precision, is growing trend for robotics in the hospitality industry. Robots prove their value by taking orders in room service, delivering guest amenities and by providing various guest services.

In December 2016 Wynn hotel in Las Vegas has made an announcement that Amazon's Echo voice-controlled speaker will be installed in all its rooms equipped with the Alexa digital assistant (HotelManagement.net, 2016) while Siri will be used by Aloft Hotels (Lodging Magazine, 2016).

Automation and robotics field the staff from performing mundane tasks and thereby increases the efficiency by streamlining tasks and improving overall service quality and reliability. Further it also ensures a unified end-to-end stay experience for the customer.

The purpose of this study is to identify the service automation procedures adopted by the hospitality industry. Further the study also attempts to understand the extent of robotics applied in the operations of a hotel industry. It also describes the importance of service automation and robotics in augmenting the service quality and customers experience in hotels.

HOSPITALITY AND AUTOMATION

Opportunities for technological advancement and service automation entered the service industry following the industrial revolution (Collier, 1983) The continuous advancement in service efficiency which leads to a greater customer experience is a result of development of information and communication technologies (Law, Buhalis, & Cobanoglu, 2014).

The recent technological advancement has a great impact on the hospitality industry by creating a platform for the adoption of service automation and robotics. Hospitality sector of recent era is driven by automation, artificial intelligence (AI) and robotics. Automation is referred as the process of using machines or devices for accomplishing predetermined or sequence of task in the process of service delivery

Automation mobile check-in and check-out, key less room assignment and entry through mobile apps, and facial recognition through biometric systems, robots acting as concierge and virtual assistants are already being introduced by many hotels around the globe to improve their operations and revolutionize the guest experience. Automation has an important role in hotels as long as it doesn't displace quality service. Understanding the human touch and personalised service, hotel operators also believe that hotel automation in certain areas can complement the human touch pave way for an effective coordination and communication between guests and hotels.

The most obvious automated system which has been introduced in many hotels is the self-service kiosks, which enable customers to check in and out during their stay. These kiosks usually installed in the lobby allow guests to access their room key using either their reservation number, name or any other reference code provided by the hotel. Some hotels

use multiple integrated and automated systems to create an entirely robotic and automated experience to the guest.

In such a fully automated hotel, Customers check-in using a mobile app and again the system allow them to use the mobile as a key card. All the required in room dining and other services are accessible through the app and through a web interface.

Robots are defined as “intelligent physical devices” (Chen & Hu, 2013) that perform intended tasks with a certain degree of independence, movement, and sensory capabilities (International Organization for Standardization, 2012; Murphy et al., 2017; Tan, Mohan, & Watanabe, 2016). The sensors installed in a robot resemble human senses and the need of these sensors is determined by the key task the robots are intended to perform. Henn na Hotel in Japan is the world-first hotel staffed by robots. Guests are greeted by multi lingual actoid androids which help guests to check in, store luggage and order food in the restaurant. An automated motorized trolley allows customers to input their details and have their luggage taken to their room, and cleaning is also conducted out by robots. The hotel proves to be cost efficient; and at the same time satisfy guest need and expectation.

The adoption and use of industrial and service robots continues to grow as indicated by the International Federation of Robotics,. As compared to 2014, unit sales of industrial robots increased by 15% (IFR, 2016a), and service robots by 25% (IFR, 2016b) in 2015.

Major hospitality chains adopt Artificial Intelligence (AI) in most of their pilot projects. AI-enabling technologies such as natural language processing, and video recognition, are rapidly improving the hospitality industry have started generating significant value by applying the technology in day-to-day operations.

Many popular brands have started implementing Internet of Things (IoT) for better connectivity. Hotels equip rooms with voice-activated devices that have internet connectivity. Hotel operators such as Marriott also use virtual assistants to control their hotel-room features with in-built speakers and voice command.

OBJECTIVES OF STUDY

Based on the above purpose, the study has been pursued with the following objectives

- To understand the adoption of service automation and robotics in various operational functions of the hotel
- To explore the influence of service automation and robotics on the service quality and customer experience
- To study the challenges of implementation and acceptance of robotics by both customers and the hotels.
- To identify the business implications due to the adoption of service automation and robotics.

RESEARCH METHODOLOGY

This is a descriptive study based on secondary data. The secondary sources used in this paper are articles, journals and reports.

AUTOMATION IN HOSPITALITY – GLIMPSES

Internet of Things (IoT) Connect

The hospitality industry has been actively adopting the recent advancements of IoT for better connectivity of devices embedded with software for efficient data exchange and less human exertions. Recent major attractions for the

global travellers are the technology enabled hotels and especially the implementation of the same in crucial areas such as the front desk and lobby. Hotels implemented Hotels started implementing self-service kiosks that empower customers to carry out check-in and check-out process automatically without the help of front office staff (Kim & Qu, 2014). To further improve the convenience for the guest and increase the service speed, the process of check-in and check-out services was offered to customers on their mobile devices (e.g., Berezina, 2015; City center Land, LLC, 2017; Hilton Honors, 2017; Marriott International, Inc., 2016; MGM Resorts International, 2017).

Major hospitality players are adopting IoT to connect with guests' smartphones and other devices. Introduction of keyless entry to a hotel room and automated check-in & checkouts using guest mobiles and respective apps is redefining the standard operating procedures of a front office in a hotel. Popular brands such as Marriott provides the automation experience to their guests through their mobile app, which serves not only as a room key but also as an access key for amenities such as spas, pools and other hotel services. Guests of a hotel feel more convenient on the usage of mobile apps and experience a faster and accurate service when compared to that of the service rendered by front desk staff. At the same time the service automation exempts the staff from their routine check-in duties and gives them time for guest interaction to provide an exceptional service and acquire a loyal customer base.

Catching the competitive wave, many hotel brands are expected to increase the deployment of IoT to a greater level in their hotel chains since they foresee a potential for growing their revenue streams through IoT. A Major hotel brand IHG uses beacon technology in their hotels to send personalised real time offers to the guest's smartphones at the time of arrival. Hotels also fetched data from the property management system to generate check in and check out the offers to leverage the decision making of the customers that can attract more revenue.

Automated and Robotic Concierge Services

In the present era as customers are becoming more tech savvy with the usage of more messages and chat, the demand for automated and robotic concierge services is also on the rise. The availability of guest history or records and synchronizing the same with an automated or robotic system enables the hotels to offer mobile services in the form of a virtual assistant. A specific app introduced by Marriott Hotels, acts as a round the clock concierge service wherein guest can request any services or amenities and text to get any recommendations. With the introduction of touch-screen tables, such as Microsoft PixelSense (Aamothe, 2014) and tablet technology, table-side ordering was made possible (Hill, 2015) Further it connects staff with the guest to attend to their needs round-the-clock. Introducing robots for various guest services is becoming a growing trend and Hotel brands like Hilton are pioneering the implementation of robots in concierge services. Robots deliver guest supplies such as towels, dental kits etc. to the guest rooms, provides food as per room service order and also used by housekeeping for vacuuming the rooms.

To better understand the customer satisfaction with the adoption of service robots in the working environment, the different dimensions of Human – Robot Interaction (HRI) have been conceptualised and operationalized by various researchers. It was found that the dimensions of HRI namely anthropomorphism, perceived intelligence, and perceived safety has a great influence on the adoption of hotel service robots. The important human function that is attributed to the robots are the human characteristics and behaviour and indeed in inducing the user intention of NAO robot for check-in anthropomorphism was significant. (Tussyadiah and Park, 2018)

Artificial Intelligence (AI) for Guest Services

Exceeding expectations to deliver on-site services to the guests play a significant role in a Hotel business. Top brands have started using virtual assistants through implementation of Artificial Intelligence (AI). The AI driven devices and apps are mutually convenient for both the hotel operators and the customers. The hotel operators integrate the AI technology in to their Property Management System (PMS) for notifying the guests on various availability of services, timings of restaurants & spa, room cleaning schedule, offers in various outlets and to provide other real time alerts. On the other side, customers use the AI service through their smartphones and respective apps to use valet, order room service and to gather local information. Currently brands like Rotana, Marriott are using AI enabled consoles as a part of guest automation services. These consoles are placed accessible to the guests, on their bedside, for operating all the light fixtures, Air – conditioning, controlling temperature and viewing time of various cities across the globe.

Chatbots for Information Service

Information becomes the core and major factor for industries such as hospitality which is very competitive and price sensitive. In the recent trend of service automation Chatbots have gained lot of importance and attention due to its ability to provide immediate and accurate information to the customers. All the basic enquiries made by the guests are answered through Chatbots, thus, fielding the hotel staff from routine questions so that they devote the time for other crucial issues. Since most of the hospitality brands have introduced their in house apps and text messaging is prevalent among customers, Chatbots become very useful to initiate conversation between human and computer in the preferred language. Since Chatbots are available throughout to be quizzed and also customers can access at their own pace, they develop a sense of familiarity and feel convenient. Customers feel easy and friendly with Chatbots since it is programmed in such a way that it converses with customers in their own native language. It is a service automation technology that is definitely winning over automated emails and repeated queries over a phone.

Virtual Reality and Augmented Reality

With technology getting more advanced with the introduction of new concepts and platforms like virtual and augmented reality, the hospitality industry is now all set to deliver a unique experience to the guest.

Experiences of the customer are said to be more persuasive when driven by virtual and augmented reality. Hotels now use virtual tour of the hotel for their programmatic advertising. Hotel brands pitch in their sales by making customers explore the hotel, rooms and other services through virtual reality than showcasing a static image. Apart from the rooms VR can also be used to make customers explore their banqueting, meetings and other event spaces. Decision making becomes easier for the customer since they are able to visualise and hold a realistic feel of the hotel. Augmented Reality (AR) is generally referred as virtual reality tech world sibling. Augmented reality has similar to that of a potential what virtual reality has in serving guests by layering applications and images over the physical surroundings.

Famous hotel chains like Premier UK has already curated a detailed surrounding neighbourhood and local area guide in their app, which is enhanced through augmented reality technology. Travellers can point their smartphones at a map on the wall of their room and see it come to life to provide details on the local points of interest. Through implementation of virtual and augmented reality, guest hotel booking experience is enhanced as customers feel a visual retreat within the accessibility of their smartphones.

CHALLENGES IN ADOPTING AUTOMATION & ROBOTICS

Though the adoption of automation and robotics in hospitality offers attractive benefits, there are certain challenges too. The extent to which service automation and robotics is perceived and used is influenced by Cultural characteristics of both service providers and customers. (Lee et al, 2013).

Device Compatibility: Interoperability among the devices for a particular automated process is a big challenge for the industry.

Collaboration of Stakeholders and Cost: Retaining the customers is a big task in this competitive world and hence it becomes increasingly important for the hotel chains to collaborate with each and every partner of the system such as airline, travel agents and so on. Loyalty programs offered to customers is one such example for a collaborative measure which lacks interoperability and hence becomes a limiting factor in their appeal and usefulness of for customers. Tracking points, monitoring the accrual and redemption of loyalty rewards lead to increased complexity and becomes difficult for program providers.

Although block chain adoption tries to resolve issues, the required high computing efficiency becomes expensive and also demands shared infrastructure and resources among the partners of the ecosystem.

Risks of Data Security and Invading Privacy: Even though there is a huge acceptance for automated check-ins using biometric systems, there is always a question on the security of the highly sensitive information of the customers. Even though various service automated systems during the guest access to the rooms such as fingerprint readers, facial recognition is widely accepted, it is difficult to convince and sell these concepts among privacy-conscious customers. Customers also feel the risk of data loss or cross linking of data when their fingerprint scans are adopted for room access.

Missing the Personal Touch: Not every customer is exhilarated with the automation initiatives of the 00011nb industry. There is still a major crowd of customers, which wants to experience the human touch, personalisation and professionalism. Since hospitality is by nature a people-centric business, for most of the travellers, staffless hotels do not offer a better on-site experience. The Attitude of the customer towards service robots range from the positive thinking of liberating humans of manual labour and the creation of business opportunities (Brynjolfsson & McAfee, 2014; Frank, Roehring & Pring, 2017; La Grandeur & Hughes, 2017; Talwar, 2015) to fear of making humans outmoded in a fully robotic environment (Barrat, 2013; Crews, 2016; Leonhard, 2016) Customers always correlate the poor service quality with that of the reduced staff and increased automation. The majority of the guests do not accept a cloud-based environment with Kiosks and bots to replace a warm atmosphere with staff to welcome them with a warm smile and provide an impeccable service.

BUSINESS IMPLICATIONS

In hotel industry the major cost centres are Food & Beverage, Rooms and other departments which include overheads and labour cost. While food and beverage and other expenses were found moderately stable for the past 5 years from 2012 to 2016, the expenses for the rooms had a significant increase. The food & beverage expenses were relatively stable within the range of 63% and other department expenses within 5%, but at the same time the room expenses constantly increased every year and showed an upsurge of 32% in 2016 as compared to 28% in 2012 (FHRAI, 2017).

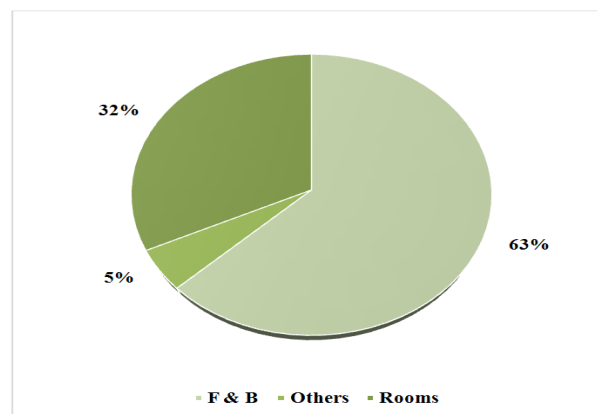


Figure 1: Expenditure Breakup in Hotel Industry

When considering the various aspects of expenses in the rooms, the labour cost deputed for the cleaning and maintenance plays a crucial role. When considering the hotels in Chennai the average employee per room is 1.7 and whereas in Bengaluru, it is 2.0 per room (FHRAI, 2017).

With the introduction of service automation and robotics in various room operations, the expenses of the room could be brought down as the menial routine jobs of the room attendants will be shared by the robots. Further, this will also have an impact on the reduction of average employee per room.

In today's world, there exist a lot of digital intermediaries in the territory of the hospitality sector, who try a grab an optimum percentage of the hotel or industry revenue. Realizing the transition and competitive threat, the hotel operators have started adopting their own service automation processes by employing advanced technologies, Artificial intelligence and mobile apps to reach out directly to their potential and existing customers. This results in savings of upto 20% of the hotel operator's revenue.

Given the fact that the labour cost (including training and development, retention, attrition) constitutes the largest among overheads when compared to all the other operational expenses involved in the hotel, it shall be a strategic advantage to introduce service automation and robots. It may reduce the labour in segments wherein there is a less requirement for a human to do a specific task thereby reducing the labour cost. Concierge robots, chatbots and automated kiosks can operate round the clock than a human employee and also cater to numerous customers simultaneously, which may not be possible in the case of human employees. Apart from the direct costs involved, adopting service automation will also reduce the other related costs incurred for the labour such recruitment, training and administration.

CONCLUSIONS

Therefore, if service automation and robots could compensate certain tasks as efficiently as humans, then, depending on costs, there will be a strategic advantage of the productivity and financial of the hotel, which could contribute positively to the company's bottom-line and enhance customer satisfaction.

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